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Proechimys dimidiatus.

By L. M. Pessôa and S. F. dos Reis

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Proechimys Allen, 1899

CONTEXT AND CONTENT. Order Rodentia, Suborder Hystricomorpha, Family Echimyidae, Subfamily Echimyinae, Genus *Proechimys*, with two subgenera *Trinomys* and *Proechimys*. The subgenus *Trinomys* contains 4 species (Moojen, 1948). A key to the species follows (modified from Moojen, 1948).

1. Guard hairs narrow, 0.5 mm in width, and limber; no differentiated light-colored pelage on outer thighs and rump; incisive foramen short and widest posteriorly, vomerine sheath complete with maxillary part wide and strong ..... *P. dimidiatus*
   Guard hairs 0.6 mm or more in width and stiff; differentiated light-colored pelage on outer thighs and rump; incisive foramen elongated and constricted posteriorly, vomerine sheath complete 2
2. Skull large, >50 mm in total length, incisors opisthodont ..... *P. iheringi*
   Skull small, <49 mm in total length, incisors orthodont or prodont 3
3. No clavate guard hairs, tail with white tip ..... *P. setosus*
   Clavate guard hairs among the ordinary ones, tail without white tip ..... *P. albispinus*

Proechimys dimidiatus (Günther)

Spiny Rat

Echimys dimidiatus Günther, 1877:747. Type locality unknown, probably southwestern part of the state of Rio de Janeiro, Brazil.

CONTEXT AND CONTENT. Context as above. There are no subspecies recognized (Moojen, 1948).

DIAGNOSIS. *Proechimys dimidiatus* can be distinguished from the other species in the subgenus *Trinomys* by narrow guard hairs; no differentiated light-colored pelage on outer thighs and rump; incisive foramen short and widest posteriorly; vomerine sheath complete with maxillary part wide and strong; and zygomatic postorbital process conspicuous and formed entirely by squamosal.

Proechimys dimidiatus is known to occur sympatrically with *P. iheringi bonafidei* in Teresópolis (Rio de Janeiro; Davis, 1947; Moojen, 1948). *Proechimys dimidiatus* can be distinguished from *P. i. bonafidei* by the maxillary part of the incisive foramen which is wide and strong in the former and thin and delicate in the latter. The two species can also be separated by the structure of the postorbital process of zygoma. In *P. dimidiatus* this process is formed only by the squamosal, and in *P. i. bonafidei* this process is formed mainly by squamosal (Moojen, 1948).

GENERAL CHARACTERS. *Proechimys dimidiatus* is a large sized spiny rat with tail averaging 80% of head and body, guard hairs narrow and soft, imparting a non-spiny character to the pelage (Fig. 1). The general color of upper parts is ochraceous-buff, finely lined with blackish brown, gradually becoming lighter on sides; ventral surface of body and inner sides of legs white; feet dorsally white but with a cepia-colored stripe along outer margin; tail brownish-black above and white below.

Average and extreme external measurements (in mm) of 19 male and 14 female *P. dimidiatus*, respectively, from Parati, Rio de Janeiro are: length of head and body, 199 (220–180), 197 (230–165); length of tail, 170 (195–150), 197 (205–190); length of hind foot, 46 (50–44), 44 (46–42; Moojen, 1948). Skull is broad with no conspicuous ridges (Fig. 2); jugal deep with transverse ridge usually conspicuous; postorbital process of zygoma involving only squamosal; incisive foramen short and wide posteriorly; vomerine sheath complete with maxillary part thick; posterior palatine foramina at plane of first molars or slightly anterior to them; bullae moderately developed.

Average and extreme cranial measurements (in mm) of 45 males and 42 females, respectively, from Parati, Rio de Janeiro are: greatest length of skull, 52.4 (56.4–48.1), 51.8 (55.1–48.6); length of condylo-incisive, 43.5 (47.1–40.4), 42.9 (45.9–39.5); zygomatic breadth, 26.2 (27.5–24.6), 25.8 (27.4–23.8); length of nasal, 19.5 (21.5–17.5), 19.4 (22.0–17.6); interorbital constriction, 12.1 (13.6–11.0), 11.8 (13.0–10.7); palatal length, 16.4 (18.0–14.4), 16.3 (18.4–14.8); crown length of cheekteeth, 8.3 (8.7–7.4), 8.3 (8.9–7.7; Moojen, 1948).

Analysis of 13 cranial dimensions of *P. dimidiatus* from Parati showed that males were always larger than females, although only length of toothrow and basal length were statistically significant (Pessôa, 1989).

DISTRIBUTION. *Proechimys dimidiatus* is apparently restricted in distribution to the state of Rio de Janeiro, from the southern limit of the state northward to and including the city of Rio de Janeiro (Fig. 3; Moojen, 1948). Altitudinal range varies from sea level to 1,000 m. No fossils are known.

FORM AND FUNCTION. The dentition is characterized by orthodont incisors and the dental formula is i 1/1, c 0/0, p 1/1, m 3/3, total 20. In juveniles, each upper molariform tooth has three counterfolds, but the posteriormost counterfold is small. In adults, the posteriormost counterfold disappears in 50% of fourth premolars and first molars, in 20% of second molars, and in 15% of third molars. Lower molariform teeth with two counterfolds occur in almost every juvenile; in adults, this number decreases to one on m3 in 20% of specimens but is rarely reduced in other teeth (Moojen, 1948).

The baculum in *P. dimidiatus* is an elongate and narrow structure with a straight shaft. The shaft does not show any development of a dorsoventral curvature, but has a lateral indentation near mid-shaft. The proximal and distal ends are evenly round, and the latter shows no development of apical wings or median depression (Pessôa and dos Reis, 1992).

FIG. 1. Live specimen of *Proechimys dimidiatus* from Teresópolis, state of Rio de Janeiro.

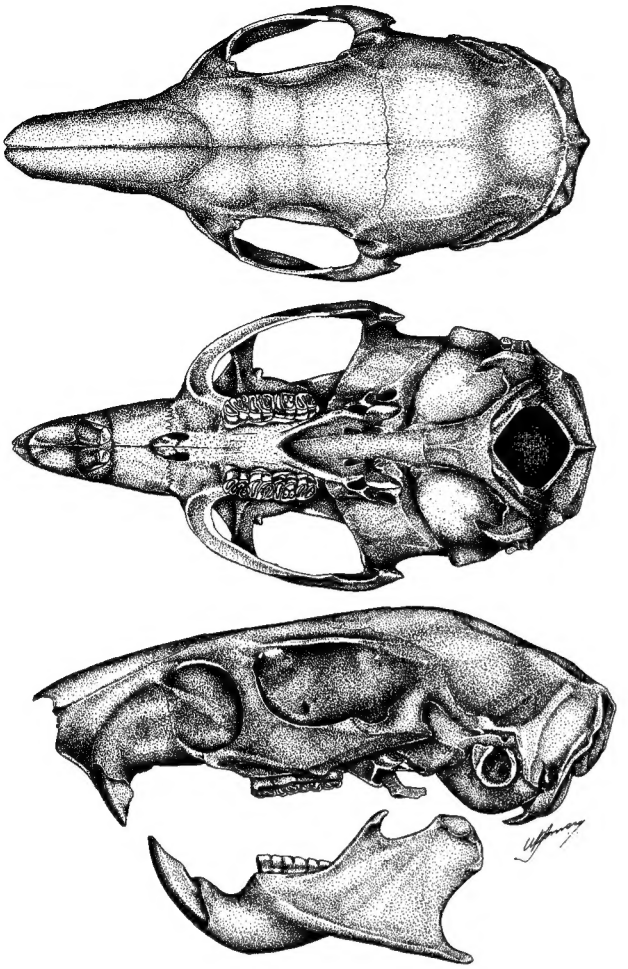

FIG. 2. Dorsal, ventral, and lateral views of cranium, and lateral view of the lower jaw of *Proechimys dimidiatus* (male, MN 10354, Museu Nacional, Universidade Federal do Rio de Janeiro). Maximum size of skull is 47.20 mm.

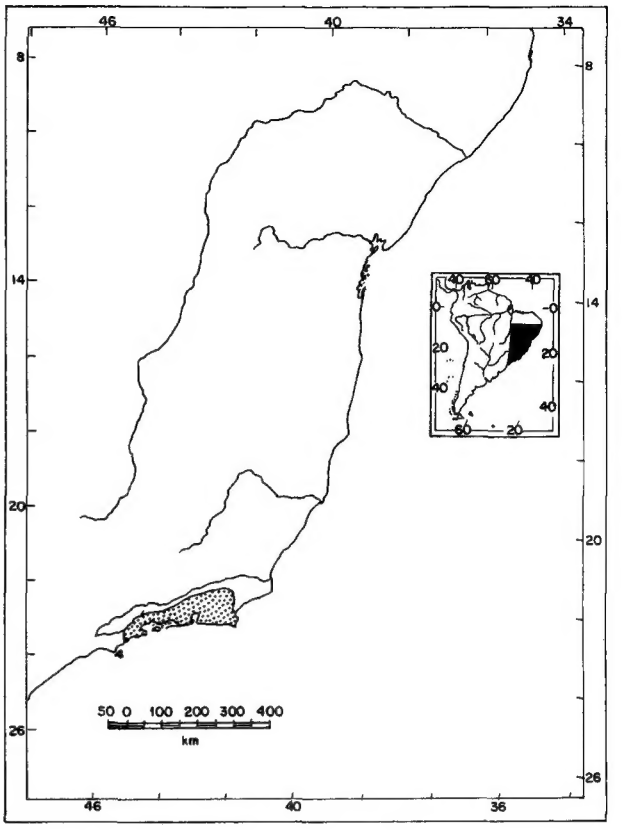

FIG. 3. Distribution of *Proechimys dimidiatus* (modified from Moojen, 1948).

Nothing is known about the physiology of *P. dimidiatus*. The longevity of *P. dimidiatus* in the wild is unknown. Moojen (1948) reported a maximum of at least 2 years for captive animals.

ONTOGENY AND REPRODUCTION. No data are available for development in *P. dimidiatus*, and information on reproduction is limited. *Proechimys dimidiatus* can be found breeding from September to November and from March to May. *Proechimys dimidiatus* has two litters per year, one in early spring and a second in late summer. The number of young per litter varies from 1 to 5, although 2 is the usual number (Moojen, 1948).

ECOLOGY AND BEHAVIOR. *Proechimys dimidiatus* is regularly found in climax forest, especially in moist places near windfalls (Davis, 1947). Typical habitat of *P. dimidiatus* is forests with an open interior containing sparse vegetation near the ground, a marked middle layer of vegetation, and large trees up to 30 m tall. Tall trees belong predominantly to the families Lauraceae and Meliaceae, while smaller trees belong to the families Anonaceae, Melastomataceae, Myrsinaceae, and Rubiaceae. Llianas and epiphytes are common in this habitat (Davis, 1945). The best shelter and nesting ground is usually under boulders, commonly near water (Moojen, 1948). *P. dimidiatus* and *P. iheringi bonafidei* occur in sympatry in the locality of Teresópolis, state of Rio de Janeiro, although the former species is found in more humid forests (Alho, 1982; Davis, 1945; Moojen, 1948).

In captivity *P. dimidiatus* shows diurnal activity, feeds on cereals and nuts, and has been observed to bury nuts in sand (Moojen, 1948).

GENETICS. The only karyotype known for *P. dimidiatus* is from a male collected in Teresópolis, Rio de Janeiro (O. B. Ribeiro, pers. comm.). This individual possessed 56 chromosomes. The autosomes include one pair of large-sized metacentrics and 26 pairs of submetacentrics. The X chromosome is a large submetacentric and the Y is a small one. This individual had also three small dot chromosomes.

Pessôa and dos Reis (1991) have applied mathematical models of evolutionary quantitative genetics to show that divergence in cranial morphology between two populations of *P. dimidiatus* could be accounted for by weak selection. The minimum selective mortality required under rapid divergence (1,000 generations) was calculated to be of the order of 10^{-3}, indicating that only 0.1% of the population would have to be culled each generation for 1,000 generations to produce the observed morphological differentiation.

REMARKS. Moojen (1948) remarked that *P. dimidiatus* and *P. iheringi* are morphologically difficult to distinguish especially on the basis of cranial traits, but recent studies have shown that these species can be easily diagnosed by bacular morphology (Pessôa and dos Reis, 1992). Moojen (1948:373) also analyzed variation in pelage and cranial characters in population samples of *P. dimidiatus* in the state of Rio de Janeiro and concluded that "Samples studied of *P. dimidiatus* are notably uniform throughout the geographic range of the species. The few biotypes detected seemed unworthy of subspecific rank." Recent studies have nevertheless revealed significant geographic variation in cranial morphometric traits and population differentiation in *P. dimidiatus* in the state of Rio de Janeiro (Pessôa, 1989; Pessôa and dos Reis, 1990; dos Reis et al., 1990).

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LITERATURE CITED

ALHO, C. J. 1982. Brazilian rodents: their habitats and habits. Pp. 143–166, *in* Mammalian biology in South America (M. A. Mares and H. H. Genoways, eds.). Special Publication, Pymatuning Laboratory of Ecology, University of Pittsburgh, Linesville, Pennsylvania, 6:1–539.

ALLEN, J. A. 1899. The generic names *Echimys* and *Loncheres*. Bulletin of the American Museum of Natural History, 12:257–264.

DAVIS, E. D. 1945. The annual cycle of plants, mosquitoes, birds, and mammals in two Brazilian forests. Ecological Monographs, 15:244–295.

———. 1947. Notes on the life histories of some Brazilian mammals. Boletim do Museu Nacional, 76:1–8.

DOS REIS, S. F., L. M. PESSÔA, AND R. E. STRAUSS. 1990. Application of size-free canonical discriminant analysis to studies of geographic differentiation. Brazilian Journal of Genetics, 13: 509–520.

GÜNTHER, A. "1876" (1877). Report on some of the additions to the collection of Mammalia in the British Museum by Dr. Albert Günther. Proceedings of the Zoological Society of London, 1876:747.

MOOJEN, J. 1948. Speciation in Brazilian spiny rats (Genus *Proechimys*, Family Echimyidae). University of Kansas Publications, Museum of Natural History, 1:301–406.

PESSÔA, L. M. 1989. Diferenciação craniana infraespecífica em *Proechimys iheringi* Thomas and *Proechimys dimidiatus* (Günther) (Rodentia: Echimyidae). M.S. thesis, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 107 pp.

PESSÔA, L. M., AND S. F. DOS REIS. 1990. Geographic variation in *Proechimys dimidiatus* (Günther) (Rodentia: Echimyidae). Zoologischer Anzeiger, 225:383–390.

———. 1991. Natural selection, morphologic divergence and phenotypic evolution in *Proechimys dimidiatus* (Rodentia: Echimyidae). Brazilian Journal of Genetics, 3:705–711.

———. 1992. Bacular variation in the subgenus *Trinomys* (Rodentia: Echimyidae: *Proechimys*). Zeitschrift für Säugetierkunde, 57:100–102.

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L. M. PESSÔA AND S. F. DOS REIS, DEPARTAMENTO DE ZOOLOGIA, IB, UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, CIDADE UNIVERSITÁRIA, ILHA DO FUNDÃO, 21941 RIO DE JANEIRO, RJ, BRAZIL AND DEPARTAMENTO DE PARASITOLOGIA, IB, UNIVERSIDADE ESTADUAL DE CAMPINAS, 13081 CAMPINAS, SP, BRAZIL.